

LISTING OF CLAIMS

1. (Previously Presented) A water-based ink comprising:
  - (A) a coloring material; and
  - (B) an aqueous dispersion of polymer particles comprising a water-insoluble graft copolymer comprising an acrylic polymer side chain (P) and a salt-forming group (Q), wherein the acrylic polymer side chain (P) is a (co)polymer consisting essentially of:

at least one monomer represented by the following formula (1),

$$\text{CH}_2=\text{C}(\text{R}^1)\text{COOR}^2 \quad (1)$$

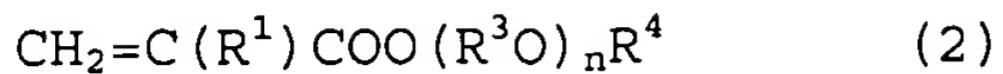
wherein  $\text{R}^1$  is a hydrogen atom or an alkyl group having 1 to 5 carbon atoms, and  $\text{R}^2$  is an alkyl group having 1 to 20 carbon atoms; and optionally

at least one comonomer selected from styrene, acrylonitrile and vinyl acetate, and

wherein the content of the monomer represented by the formula (1) in the (co)polymer is not less than 60 % by weight

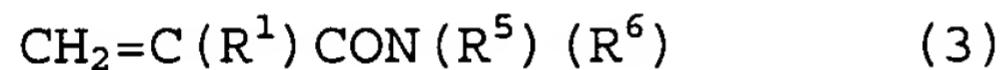
wherein the graft copolymer has a nonionic polymer side chain (R) comprising:

(I) a polymer made of at least one monomer represented by the formula (2) :



wherein  $\text{R}^1$  is as defined above;  $\text{R}^3$  is a divalent hydrocarbon group having 1 to 30 carbon atoms, which may have a heteroatom;  $\text{R}^4$  is a hydrogen atom or a monovalent hydrocarbon group having 1 to 30 carbon atoms, which may have a heteroatom; and  $n$  is a number of 1 to 60;

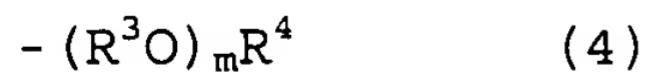
(II) a polymer made of at least one monomer represented by the formula (3) :



wherein  $\text{R}^1$  is as defined above; and each of  $\text{R}^5$  and  $\text{R}^6$  is independently a hydrogen atom or an alkyl group having 1 to 5 carbon atoms;

(III) a copolymer made of at least one monomer represented by the formula (2) and at least one monomer represented by the formula (3); or

(IV) a group represented by the formula (4) :



wherein  $\text{R}^3$  and  $\text{R}^4$  are as defined above; and  $m$  is a number of 3 to 60

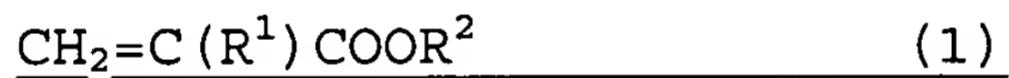
wherein the content of said nonionic polymer side chain (R) is 10 to 35% by weight of said graft copolymer.

2. (Currently Amended) A The water-based ink according to ~~claim 1~~, comprising:

(A) a coloring material; and  
(B) an aqueous dispersion of polymer particles comprising  
a water-insoluble graft copolymer comprising an acrylic  
polymer side chain (P) and a salt-forming group (Q),  
wherein the acrylic polymer side chain (P) is a (co)polymer  
consisting essentially of:

at least one monomer represented by the following formula

(1),



wherein R<sup>1</sup> is a hydrogen atom or an alkyl group having 1 to 5  
carbon atoms, and R<sup>2</sup> is an alkyl group having 1 to 20 carbon atoms;  
and optionally

at least one comonomer selected from styrene,

acrylonitrile and vinyl acetate, and

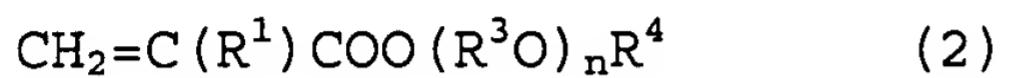
wherein the content of the monomer represented by the formula

(1) in the (co)polymer is not less than 60 % by weight

wherein the graft copolymer has a nonionic polymer side chain

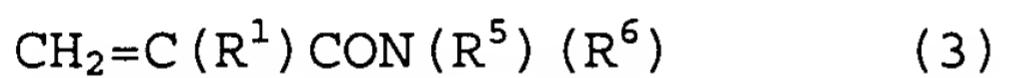
(R) comprising:

(I) a polymer made of at least one monomer represented by the formula (2):



wherein R<sup>1</sup> is as defined above; R<sup>3</sup> is a divalent hydrocarbon group having 1 to 30 carbon atoms, which may have a heteroatom; R<sup>4</sup> is a hydrogen atom or a monovalent hydrocarbon group having 1 to 30 carbon atoms, which may have a heteroatom; and n is a number of 1 to 60;

(II) a polymer made of at least one monomer represented by the formula (3):



wherein R<sup>1</sup> is as defined above; and each of R<sup>5</sup> and R<sup>6</sup> is independently a hydrogen atom or an alkyl group having 1 to 5 carbon atoms;

(III) a copolymer made of at least one monomer represented by the formula (2) and at least one monomer represented by the formula (3); or

(IV) a group represented by the formula (4):



wherein R<sup>3</sup> and R<sup>4</sup> are as defined above; and m is a number of 3 to 60

wherein the content of said nonionic polymer side chain (R) is 10 to 35% by weight of said graft copolymer

wherein the graft copolymer is a vinyl polymer obtained by copolymerizing

- (i) a (meth)acrylic macromer (a) having a polymerizable functional group at one end;
- (ii) a polymerizable unsaturated monomer (b) having a salt-forming group; and
- (iii) a monomer (c) copolymerizable with the (meth)acrylic macromer (a) and the polymerizable unsaturated monomer (b).

3. (Original) The water-based ink according to claim 2, wherein at least a part of the monomer (c) is a monomer represented by the formula (2):



wherein R<sup>1</sup> is as defined above; R<sup>3</sup> is a divalent hydrocarbon group having 1 to 30 carbon atoms, which may have a heteroatom; R<sup>4</sup> is hydrogen atom or a monovalent hydrocarbon group having 1 to 30

carbon atoms, which may have a heteroatom; and n is a number of 1 to 60.

4. (Canceled)

5. (Previously Presented) The water-based ink according to claim 1, wherein the graft copolymer is a polymer prepared by the polymerization of a polymer (S) having an initiator structure showing a function as an initiator for polymerization or addition reaction with a monomer (m) for initiating a polymerization or an addition reaction by the polymer (S), or by the addition reaction of the monomer (m) to the polymer (S).

6. (Previously Presented) The water-based ink according to claim 5, wherein the polymer (S) is a polymer having an initiator structure prepared by converting to an initiator structure an initiator precursor structure of a polymer (T) having an initiator precursor structure which is convertible to an initiator structure, and the polymer (T) is a homopolymer made of a monomer (n) having an initiator precursor structure, or a copolymer of the monomer (n) with a monomer (o) copolymerizable with the monomer (n).

7. (Previously Presented) The water-based ink according to claim 1, wherein the graft copolymer is a polymer prepared by

reacting a reactive group (h) of a polymer which forms a main chain with a reactive group (i) of a polymer which forms a side chain, said reactive group (i) being positioned at the terminal of the polymer and having a reactivity with the reactive group (h).

8. (Original) The water-based ink according to claim 1, wherein the polymer particles comprise at least one agent selected from the group consisting of ultraviolet ray absorbents, photostabilizers, antioxidants and ozone-deterioration preventives.

9. (Original) The water-based ink according to claim 1, wherein the graft copolymer has a functional group showing at least one property selected from the group consisting of ultraviolet ray absorptivity, photostabilization, antioxidation and ozone-deterioration prevention.

10. (Previously Presented) The water-based ink according to claim 1, wherein the content of the colorant of said coloring material (A) is 1 to 50% by weight of said coloring material (A).

11. (Canceled)

12. (Previously Presented) The water-based ink according to claim 1, wherein said acrylic polymer side chain (P) is a

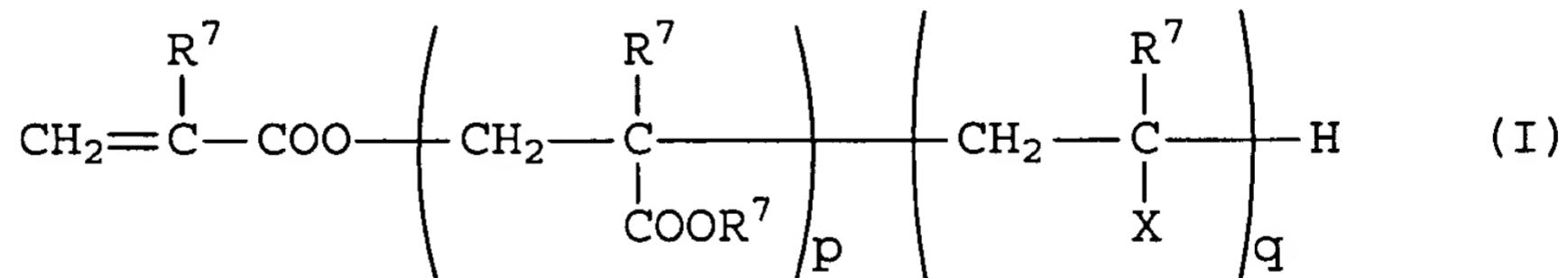
polylauryl methacrylate side chain or a polyisobutyl methacrylate side chain.

13. (Previously Presented) The water-based ink according to claim 1, wherein the content of said acrylic polymer side chain (P) is 10 to 35% by weight of said graft copolymer.

14, 15. (Cancelled)

16. (Previously Presented) The water-based ink according to claim 2, wherein the number-average molecular weight of said (meth)acrylate macromer (a) is from 1,000 to 10,000.

17. (Previously Presented) The water-based ink according to claim 2, wherein said (meth)acrylate macromer (a) is a compound represented by formula (I):



wherein each of R<sup>7</sup> is independently a hydrogen atom or a hydrocarbon group having 1 to 12 carbon atoms; X is at least one group selected from the group consisting of -COOR<sup>7</sup> (R<sup>7</sup> is defined as

above), an aromatic group having 6 to 12 carbon atoms, nitrile group and  $-\text{OCOCH}_3$ ; and each of p and q is an integer satisfying the relationship p/q (molar ratio) of 6/4 to 10/0 and a number-average molecular weight of 1000 to 10,000.

18. (Previously Presented) The water-based ink according to claim 1, wherein the aqueous dispersion is an aqueous dispersion of polymer particles of the graft copolymer containing the coloring material.

19-20. (Cancelled)

21. (Previously Presented) The water-based ink according to claim 1, wherein said acrylic polymer side chain (P) is a polymer made from one or more monomers selected from the group consisting of methyl methacrylate, ethyl methacrylate, propyl methacrylate, n-butyl methacrylate, i-butyl methacrylate, 2-ethylhexyl methacrylate, octyl methacrylate, lauryl methacrylate, methyl acrylate, ethyl acrylate, n-butyl acrylate, i-butyl acrylate, and 2-ethylhexyl acrylate.

22. (Cancelled)

23. (Previously Presented) The water-based ink according to claim 1, wherein the glass transition temperature of the main chain of said graft copolymer is from 30°C to 120°C.